2011 Military Health System Conference

Critical Advances in Wound Care

The Quadruple Aim: Working Together, Achieving Success

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Disclaimers

- The views expressed in this presentation are those of the author(s) and do not necessarily reflect the official policy or position of the Department of the Navy, Army, Department of Defense, nor the U.S. Government. No federal endorsement is intended or implied

Combat Wound Initiative Program

A Bench-to-Bedside (Wound –to-Rehabilitation) Strategy for Wounded Warrior Research

- Proving ground for emerging wound care technologies and treatments in support of wounded warriors
- Bio-banking: Collection and storage of blood, wound fluid and tissue for translational research to advance complex wound care
- Personalized medicine: Development of predictive models to advance individualized wound therapy through clinical decision support
- State-of-the-art care: Complex Wound and Limb Salvage Center
- Strategic private-public partnerships to enhance the quality of care for wounded personnel

Complex Wound And Limb Salvage Center Vision

- Background: Un-met need for comprehensive, centralized, outpatient complex wound care and limb salvage within the Military Health System
- Driving policy: Integrated state-of-the-art care for wounded warriors and beneficiaries with acute and chronic wounds
- Benchmarks: Multi-disciplinary team established and clinic launched at WRAMC and NNMC March 2008

Complex Wound And Limb Salvage Center

- Needs assessment, supportive data:
  - Search period: 6 months
  - Complex wound & limb salvage – specific ICD9 codes
  - 10,280 visits across 33 outpatient clinics (1,713 / month)
  - 1,587 patients: 6.5 visits/patient over 6–month period
  - Average 50 patients/month leak to network across 40 clinics
- Analysis:
  - 1 visit / month inappropriate for most complex wound patients
  - Visit frequency inadequate to meet rehabilitation needs
  - Variable wound care presently spread over numerous clinics

Conclusion: Efficient, centralized, evidence-based, inter-disciplinary care team represents an un-met need.

Complex Wound And Limb Salvage Center

Strategic Connection

- Readiness: Reduced time to rehabilitation, return to duty
- Research: Translational Research program: Combat Wound Initiative Program (Private-Public National and International partnership)
- Quality care: Multi-disciplinary team, evidence-informed best practice protocols
- Cost-effective care: Reduced emergency room visits and hospital re-admissions, focused management
- Graduate Medical Education: Resident and staff education; recapture of patients lost to network and multi-service consultation supports GME mission

Complex Wound And Limb Salvage Center

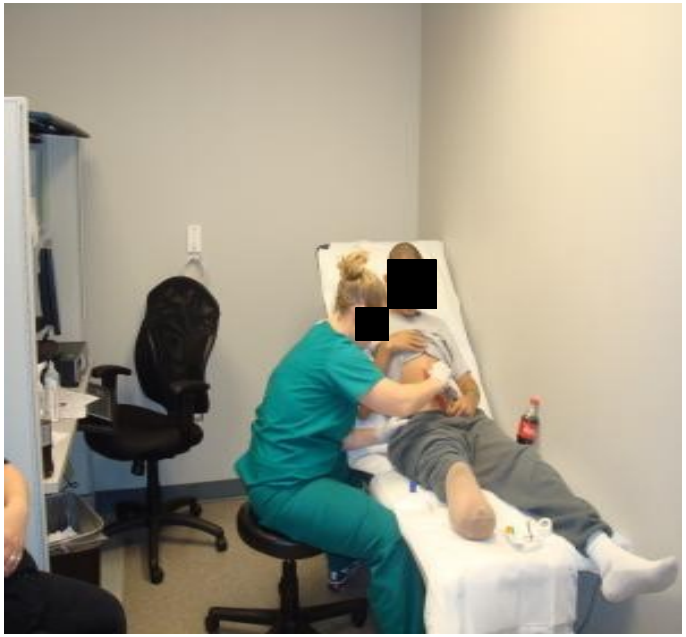
Multi-Disciplinary CWLSC Team

- Wound specialist M.D. General surgeon Orthopaedist
- Vascular surgeon Plastic surgeon Pedorthetist
- Prosthetist Trauma surgeon Diabetologist
- Nutritionist Infectious disease specialist
- Administrator Physical and occupational therapist
- Nurse practitioner Wound clinic manager
- Case manager Wound care nurse
- Podiatrist Healthcare specialist
- Receptionist Medical records specialist/coder
- Photographer Clinical research nurse
- Data manager Research study assistant

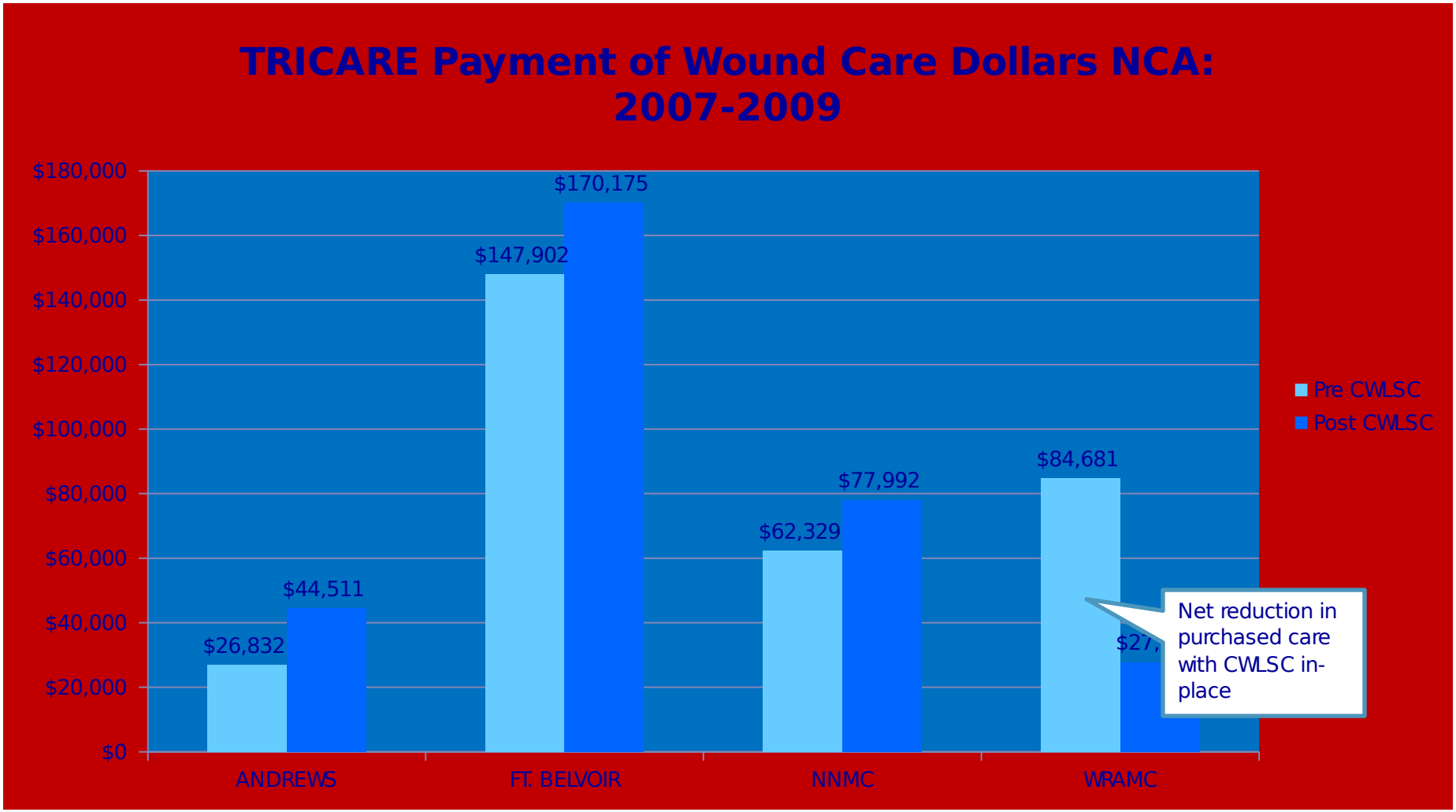
Complex Wound And Limb Salvage Center

Physical Plant

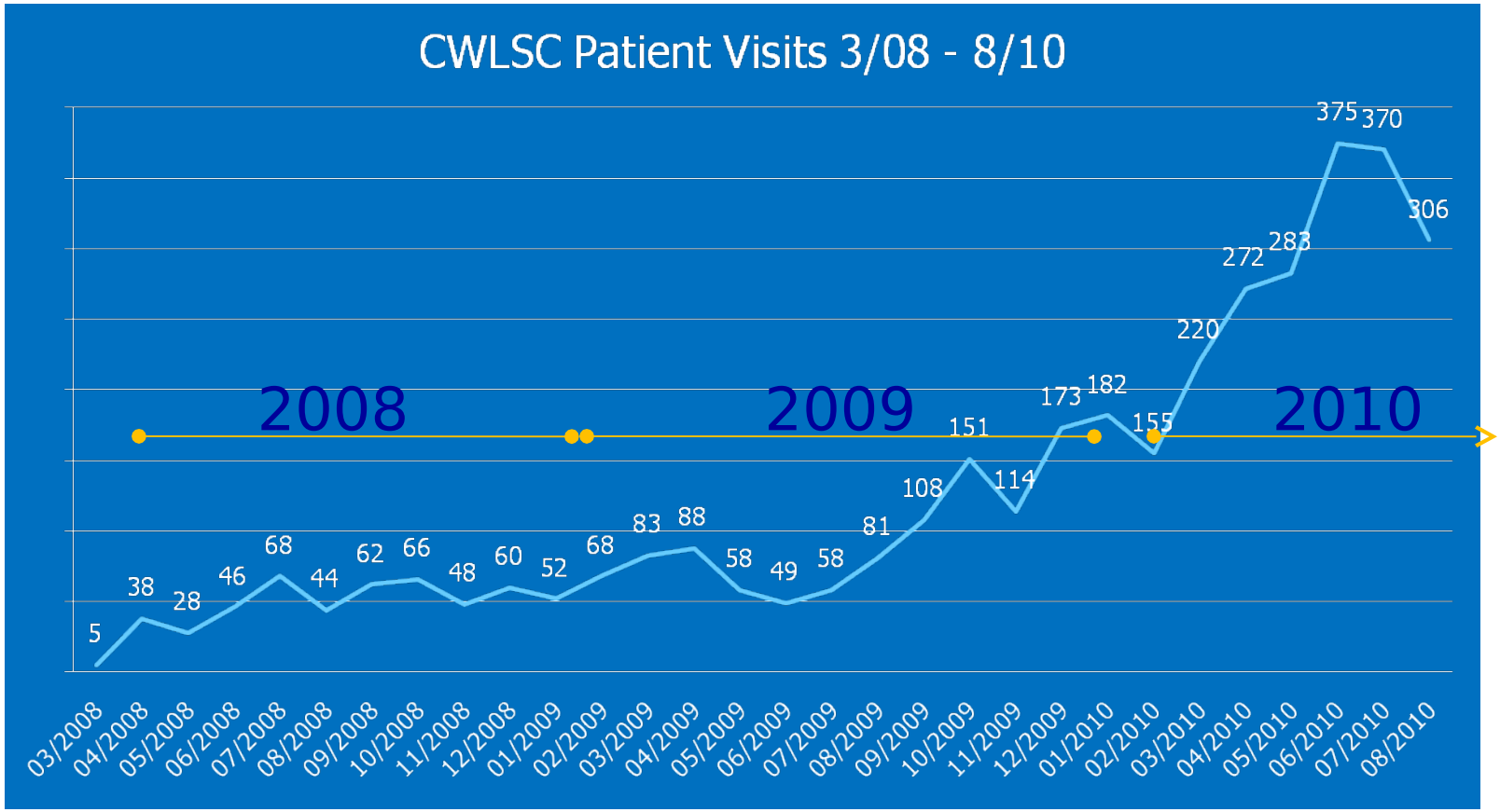
- Military Advanced Training Center
- Easy patient access
- Proximity to radiology, vascular testing, physical therapy, orthotic and prosthetic lab
- Multiple exam rooms with adequate lighting, exam tables, and surgical instruments
- Proximity to Operating Room for surgical wound

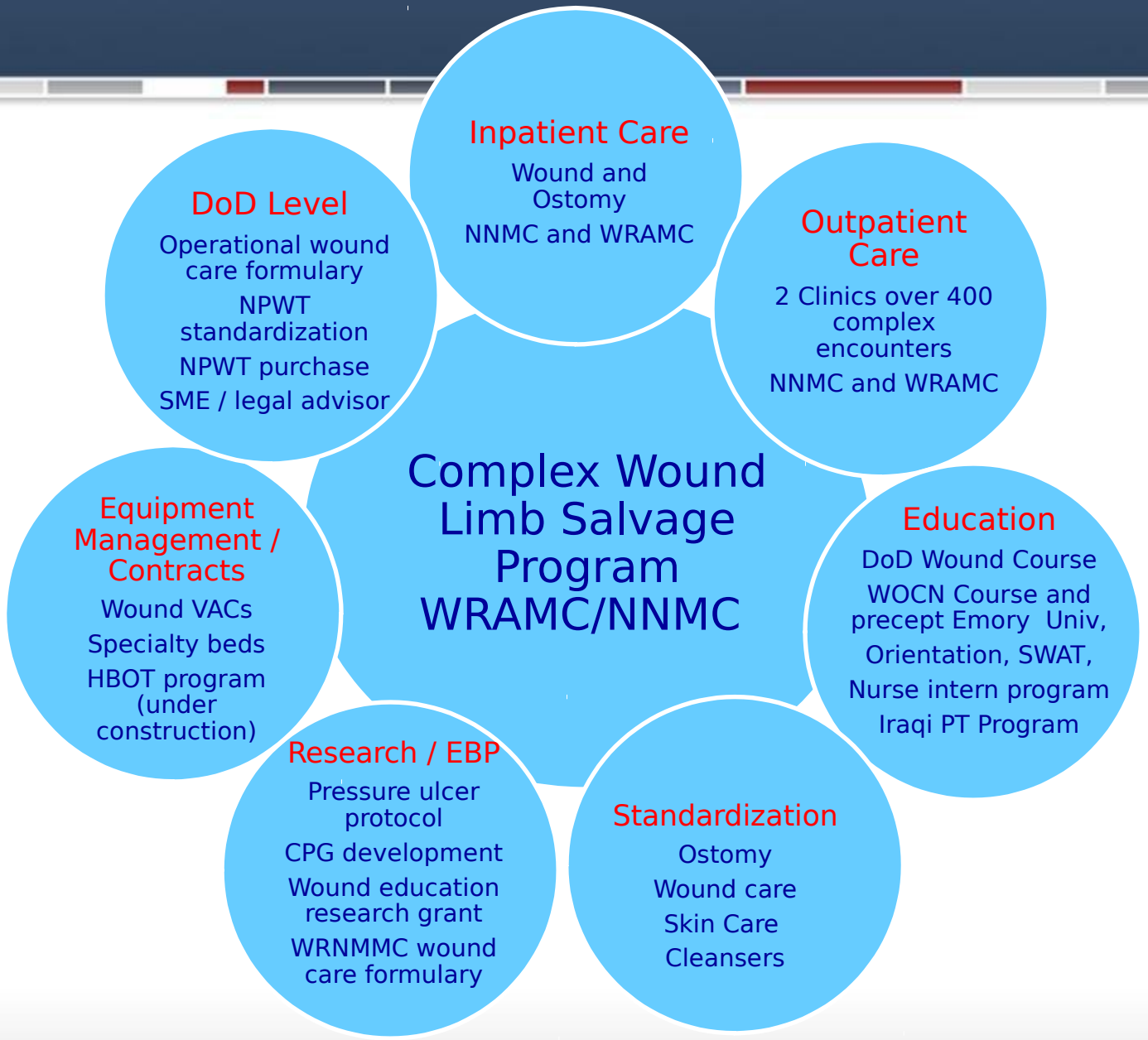


Complex Wound And Limb Salvage Center



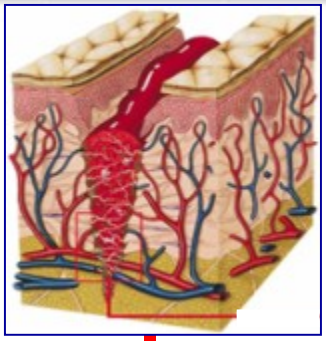
Complex Wound And Limb Salvage Center

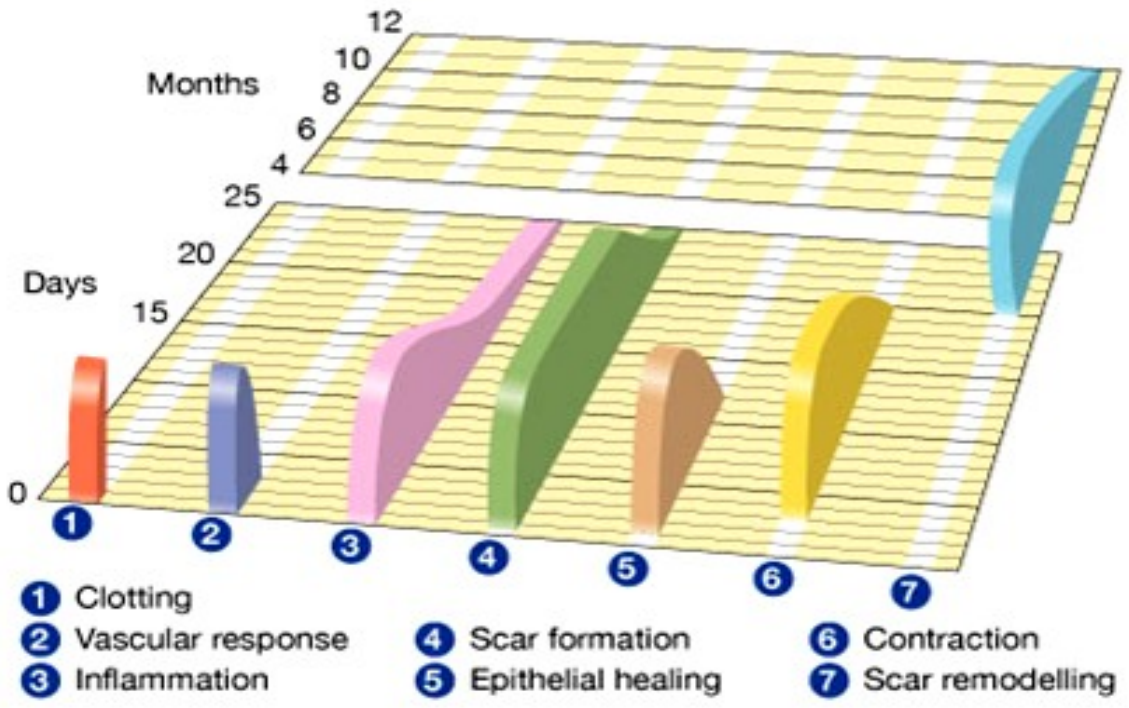



Complex Wound Limb Salvage Program WRAMC/NNMC
Inpatient Care
Wound and Ostomy
NNMC and WRAMC
Outpatient Care
2 Clinics over 400 complex encounters
NNMC and WRAMC
Education
DoD Wound Course
WOCN Course and precept Emory Univ,
Orientation, SWAT,
Nurse intern program
Iraqi PT Program
Standardization
Ostomy
Wound care
Skin Care
Cleansers
Research / EBP
Pressure ulcer protocol
CPG development
Wound education research grant
WRNMMC wound care formulary
Equipment Management / Contracts
Wound VACs
Specialty beds
HBOT program (under construction)
DoD Level
Operational wound care formulary
NPWT standardization
NPWT purchase
SME / legal advisor

Development Of The Program

Sequence of Molecular and Cellular Events in Skin Wound Healing





Four Phases of Healing

Hemostasis
Inflammation
Repair
Remodeling

1 2 3 4 5 6 7

Vascular Scar Epithelial

Scar

g

Co

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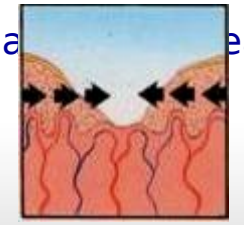

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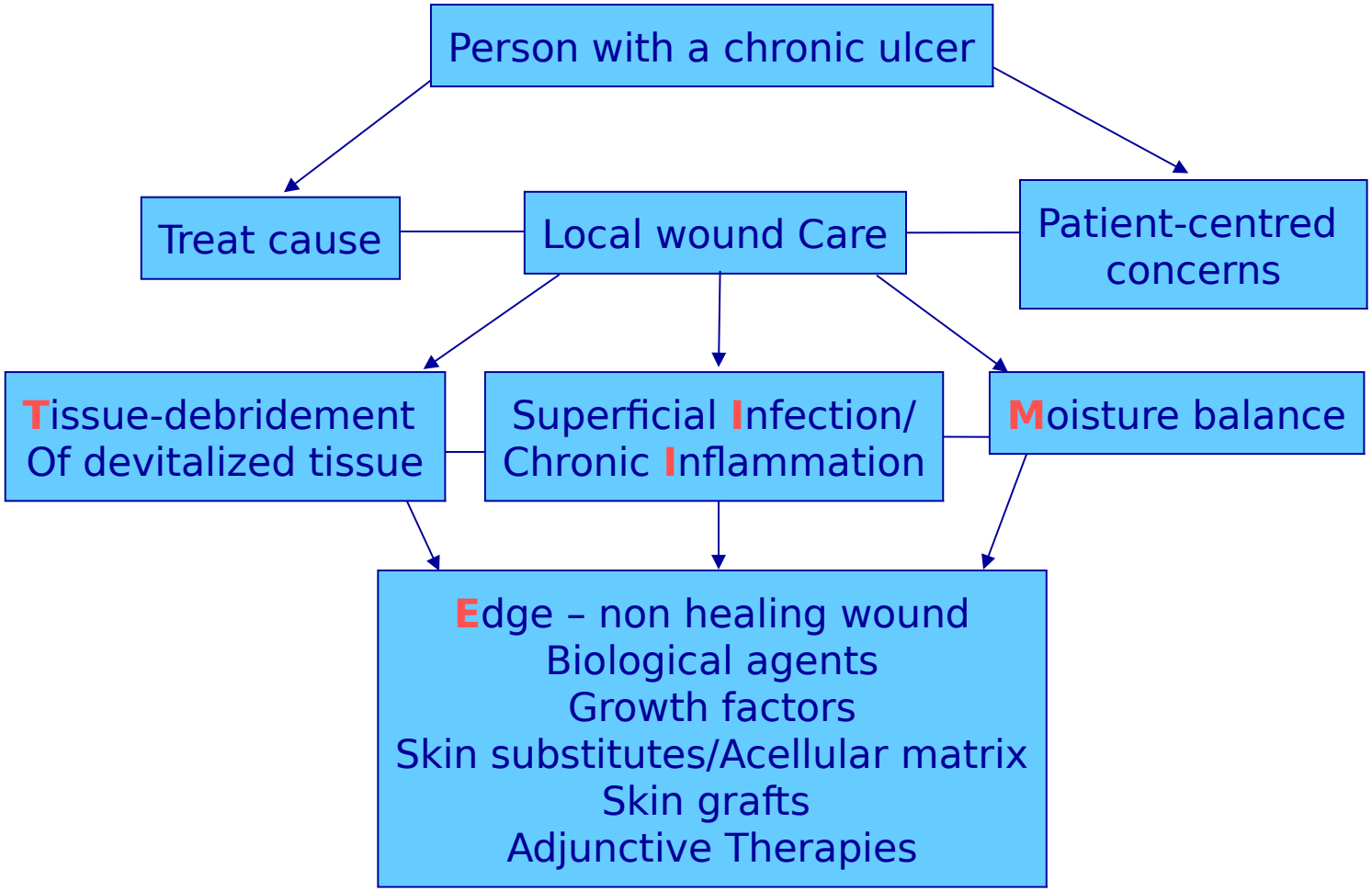
Wound Bed Preparation Algorithm



Sibbald, Orstead, Schultz, Coutts, Keast. Preparing the Wound Bed – Focus on Infection and Inflammation. Ostomy Wound Manag 49:24-51, 2003

Identify Problem Wounds Early And Transition To Advanced Therapy

- **"Good" Wound Care**
  - History
  - Assessment
  - Debridement
  - Warm, Moist Environment
  - Offloading
  - Topical Care

- **Advanced Wound Care**
  - Hyperbaric Medicine
  - Growth Factors
  - Bioengineered Alternative Tissues
  - Negative Pressure Therapy
  - Biologic Dressings
  - Active Topicals
  - Plastic Surgery
  - Curative Surgery

Diabetes Care. 2003 Jun;26(6):1879-82. Percent change in wound area of diabetic foot ulcers over a 4-week period is a robust predictor of complete healing in a 12-week prospective trial. Sheehan P, Jones P, Caselli A, Giurini JM, Veves A.

Key Factors Leading To Failure to Heal

- Underlying pathophysiology: venous and/or arterial insufficiency, diabetes and neuropathy, prolonged immobilization
- Infection or high bacterial colonization
- Immunosuppression
- Concomitant disorders
- Nutritional deficits
- Adverse effects of medications on the healing process

Kane DP, Krasner D, eds. *Chronic Wound Care: A Clinical Source Book for Healthcare Professionals*. 2nd ed. Health Management Publications Inc, 1997;1-4. Falanga V, ed. *Cutaneous Wound Healing*. Martin Dunitz; 2001.

Complex Wound And Limb Salvage Center

Current status

- Parallel Clinics at NNMC and WRAMC
  - Dedicated clinical space and personnel
  - Integrated SOPs / Clinical Practice Guidelines
  - Common supply chain
- Forging relationship with multi-disciplinary team throughout the National Capitol Area
- Outreach program: On-campus, ER, in-patient services, other DoD facilities

Complex Wound And Limb Salvage Center

- Inpatient Care- NNMC, WRAMC
- All aspects of treatment- ostomy care, war wounded, intraoperative consults, pressure ulcers, acute and chronic wounds
- Collaboration with inpatient teams is essential
- Education for the inpatient staff also critical for improved outcomes
- Procedures/care done at bedside, in the PACU or in the OR

Outpatient Care

- Outpatient Care-NNMC/WRAMC
  - Over 400 patient visits monthly
  - Co-treatment with PT/OT in the MATC
  - Advanced wound care treatments and modalities used
  - Standardization of wound care, ostomy, skin care and cleansers is key
  - Major improvement in the “standard of care”- i.e. wet to dry is NOT standard anymore

Advanced Wound Care Products And Modalities

- Silver based dressings
- Honey dressings
- Atraumatic dressings
- MIST Ultrasound
- Qoustic Debridement
- Ultraviolet-C Therapy
- Scar Treatment
- Lymphedema care

Wound Dressings-Current State Of Affairs

- 1 of the greatest and most confusing challenges in wound care
- Over 3000 wound dressing products
- Over 30 different dressing categories
- Inappropriate dressings can lead to a delay in wound healing
- Many dressing choice strategies exist and have merit; the clinician must choose which to use.

Broussard CL. Dressing decisions. In Krasner DL, Rodeheaver GT, Sibbald RG,eds. **Chronic Wound Care: A Clinical Source Book for Healthcare Professionals. 4th ed.** Malvern, PA: HMP Communications, 2007: 249-262.

Which One Is Best?

Standardization

- Ostomy Supplies
- Wound Care
- Cleansers
- Skin Care
- Developed with SME and contracts established with wound companies
- Education to the inpatient units commenced

Complex Wound And Limb Salvage Center
Product Standardization

- Wound care
- Ostomy
- Skin care
- Devices
- Beds and support services
- Operational Wound care products

NNMC & WRAMC Wound Dressing Selection Guide

WALTER REED ARMY MEDICAL CENTER

	Eschar* (Colors may vary)	Predominantly Slough (Infection may be present)	Granulating/ Mixed Wound Tissue	Fibrin (Appears yellow)	Granulating and/or Epithelializing	Skin Tear	Epithelializing	Healed Wounds, Skin at Risk or Closed Surgical Incisions
Exudate Level (● = indication of exudate level)	Moderate to None	High ← to Moderate			Moderate ← to Scant			None
Depth	Unknown	Deep	Deep/Shallow	Deep/Shallow	Deep/Shallow	Shallow	Shallow	Closed
Treatment Objective	Debride*	Cleanse, Debride, Absorb, Fill Dead Space			Protect, Hydrate, Fill Dead Space			Protect
Suggested Products and Change Rates (To the right are management options for each wound condition)	Carrasyn V Gel or Collagenase (needs Rx) (Daily) Cover choices: **Alldress®** or **Mepilex® Border** or **Mepilex® Border Lite**	Iodosorb Gel (daily) or **Melgisorb®** (Up to 4 days) or Aquacel Cover choices: **Alldress®** or **Mepilex®** or **Mepilex® Border**	Deep Iodosorb Gel (daily) or **Melgisorb®** (Up to 4 days) or Aquacel Cover choices: **Alldress®** or **Mepilex®** or **Mepilex® Border** Shallow **Alldress®** or **Mepilex®** or **Mepilex® Border** or Comfeel Plus	Moderate Exudate Iodosorb Gel (daily) or **Melgisorb®** (Up to 4 days) or Aquacel Cover choices: **Alldress®** or **Mepilex® Border** Minimal Exudate **Mepilex®** or **Mepilex® Border Lite** Shallow **Alldress®** or **Mepilex® Border Lite** or Comfeel Plus	Moderate Exudate **Melgisorb®** (Up to 4 days) or Aquacel Cover choices: **Alldress®** or **Mepilex® Border** Minimal Exudate **Alldress®** or **Mepilex® Border** or **Mepilex® Border Lite** or Comfeel Plus Contact layer **Mepitel®‡** (Up to 10 days)	Skin Tear Prevention Tubifast® to upper and lower extremities as needed Contact layer **Mepitel®‡** (Up to 10 days) or **Mepilex® Border** or **Mepilex® Border Lite** or **Mepilex®** or **Mepilex® Lite**	**Mepitel®‡** (Up to 10 days) or **Mepilex®** or **Mepilex® Lite** or **Mepilex® Border** or **Mepilex® Border Lite** or **Alldress®** or Comfeel Plus	**Mepilex® Border Lite** or **Mepilex® Lite** or Apply 3M No-Sting Barrier (Daily) Post Surgical **Mepilex® Border Post-Op** Radiation Dermatitis **Mepilex® Lite** or **Mepilex® Transfer**

Consider using Mepilex Ag or Aquacel Ag or Melgisorb Ag when antimicrobial effect is desired

Notations

- Use secondary dressing over **Mepitel**
- Use **Mepitac** Tape on fragile skin. Secure dressings with **Tubifast** of roll gauze.
- For complex wounds consult the Wound Care Team
- Date and time ALL dressings
- Utilize **Mepilex Heel** or **Mepilex Border** as needed for heel wounds and/or protection from shearing
- Wear time for each dressing is up to 7 days unless otherwise noted
- Cleanse wounds with normal saline or wound cleanser with each dressing change
- Dressings with **Safetac®** technology do NOT require use of skin barrier products.

Individuals with wound infection or those at high risk for infection may require more frequent changes as well as adjunctive antibiotic therapy. Before any healing process can begin, two critical steps must be taken as part of a well-defined management protocol:
1) The wound assessment and 2) Management of causative and contributing factors including unrelieved pressure, shear and friction, excessive moisture and altered nutritional status.
* Debridement of eschar may be contraindicated in some situations such as dry, fixed, stable eschar. Debridement is indicated if signs/symptoms of infection are present.
‡ Creams or ointments may be applied over **Mepitel** as indicated. **Mepitel** may be left in place during wound cleansing and irrigation. Change secondary dressings as needed.
This tool has been provided by means of an educational grant to NNMC by Mölnlycke Health Care.
The suggested topical management options and change rates are the treatment choice of NNMC and may not reflect the opinions of Mölnlycke Health Care

MÖLNLYCKE HEALTH CARE

The Use Of Honey – A Historical Perspective

2000 year history

- Smith Papyrus (the world's oldest known medical document, 4,000 yrs old)
  - honey mixed with grease and lint to keep it on the wound
- Aristotle 2 millennia ago
  - some honeys are better than others for use in wound treatment
- Usage declined at the introduction of penicillin in 1940's

Has been well re-established in wound care in the UK, other parts of Europe, Australia, New Zealand over the past 2-3 years.

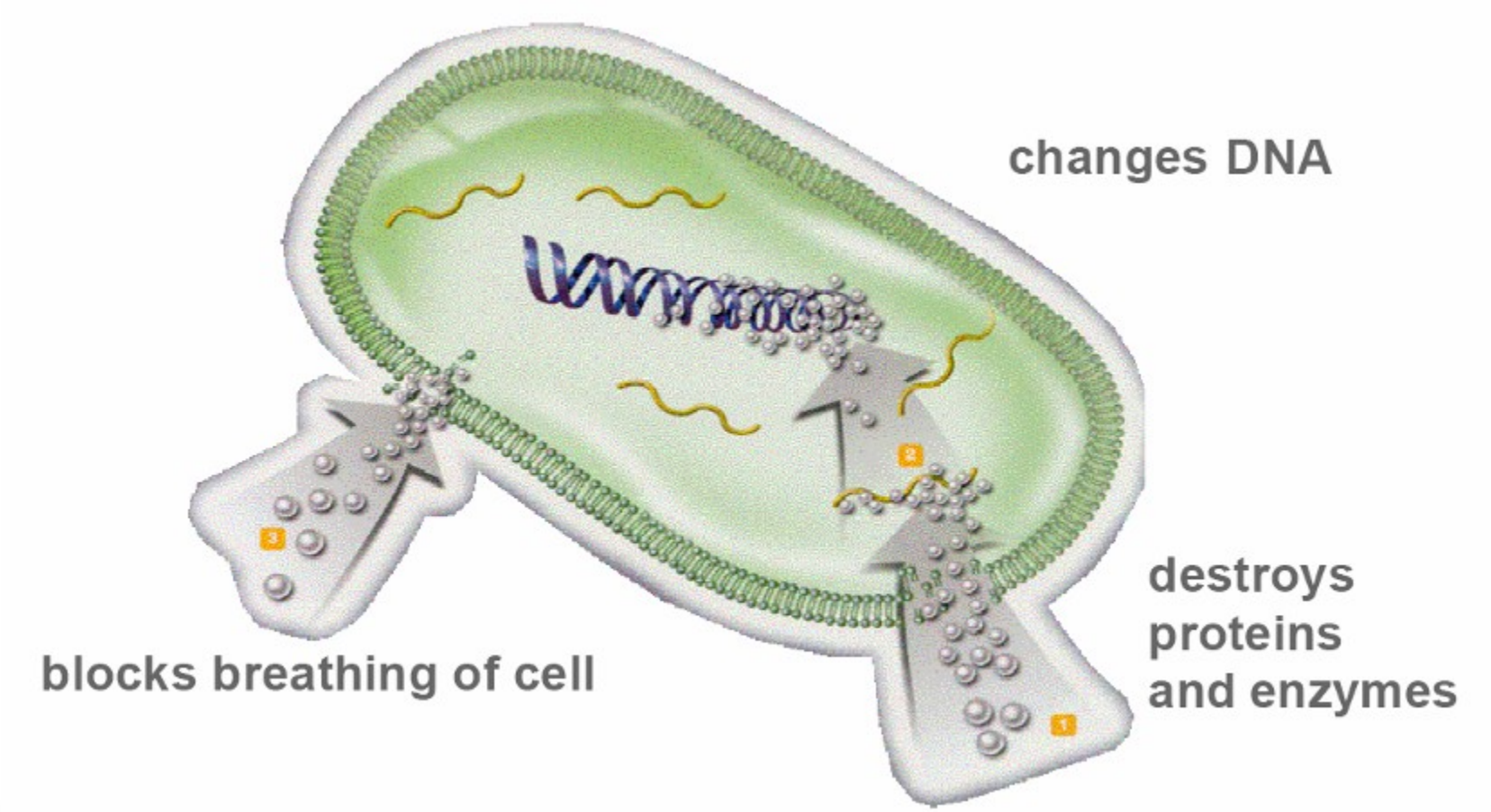
The Use Of Silver- A Historical Perspective

Similar History with Honey

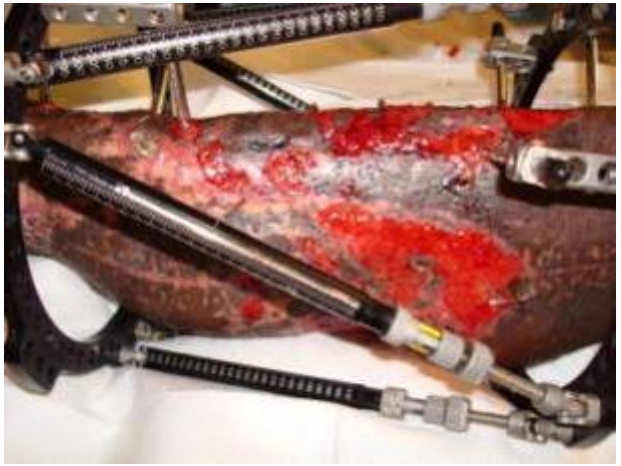
- Romans used silver nitrate therapeutically
- People of ancient Greece and Rome used silver containers for keeping liquids fresh
- Silver foil dressings were used for dressing wounds until just after WWII (when antibiotics became widespread).

Has been re-established in wound care over the past decade.

Silver Modes Of Action



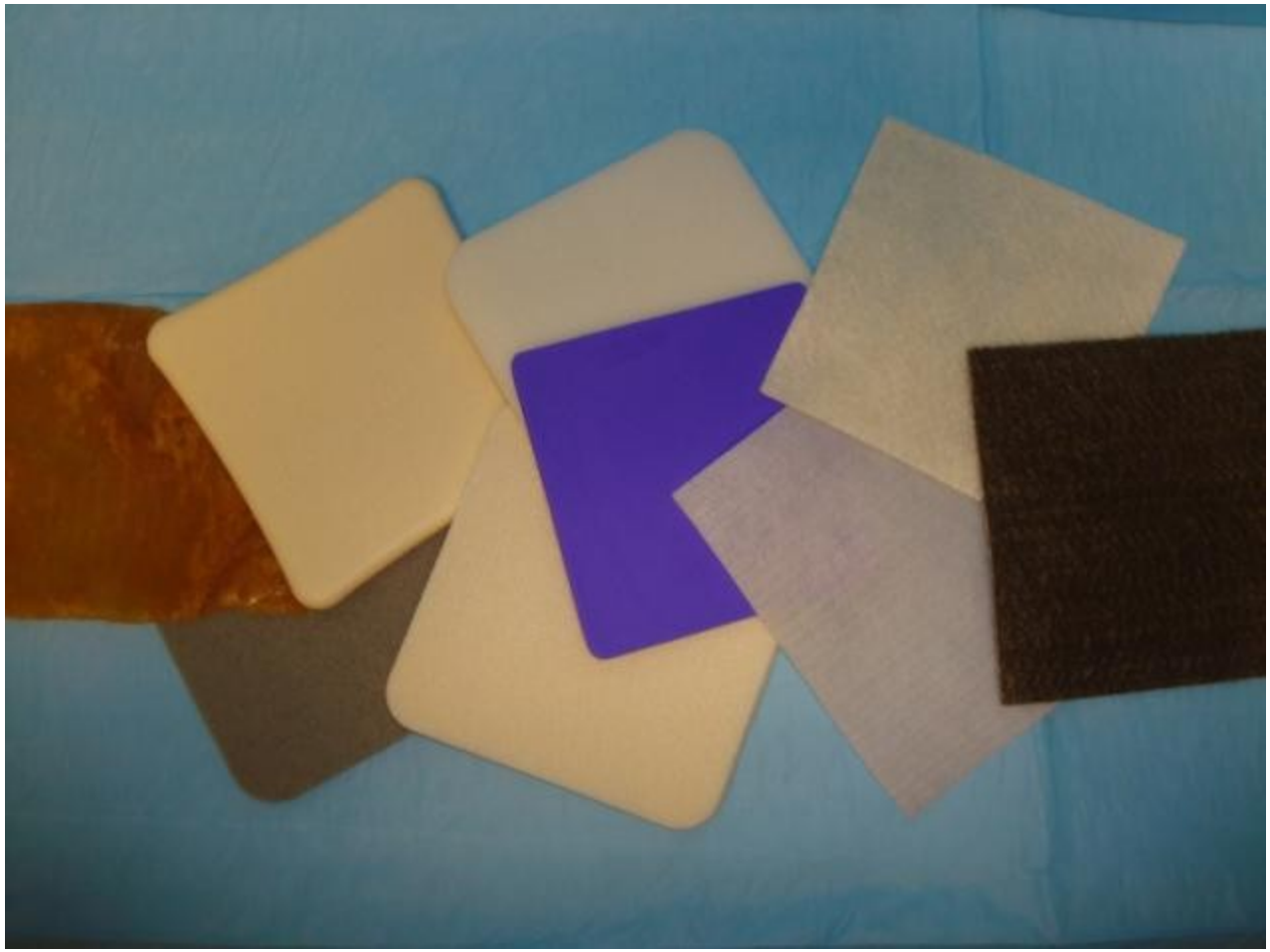
Wounds Of War- Straightforward



Lateral Leg / BKA Wounds

Anterior Thigh Donor Sites

Antimicrobials And Absorptives



Left Lower Extremity

Dressings- Mepilex Ag And Acticoat

Final Dressings

MIST Ultrasound Healing Therapy

- MIST Ultrasound Generator
- MIST Applicator Kit
  - Applicator
  - Normal saline
  - Antiseptic wipes
  - Absorbent pad

How Is MIST Therapy Different?

- Low frequency, low intensity ultrasound
  - 40kHz
- Noncontact
- The only ultrasound device cleared by the FDA to promote wound healing

FDA Indication

*The MIST Therapy System produces a low energy ultrasound-generated mist used to **promote wound healing** through wound cleansing and gentle debridement by the removal of yellow slough, fibrin, tissue exudates and bacteria.*

Wound Healing Adjuncts

- Bioengineered tissues
  - Acell
    - Rebuilding of severed digits
  - Apligraf/Dermagraft
    - Grafts from neonatal tissue
  - Integra
    - Tissue scaffold, collagen matrices

Advancing The Science

- Advancing the science of wound healing within the military healthcare system requires more than a multidisciplinary team using advanced technology. It is requisite that we collaborate, employing a Joint effort throughout the continuum of care, that we disseminate knowledge through education, and that clinicians and researchers collaborate in translational research.

Advancing The Science

- Evidence-Based Protocols, Performance Improvement, and Research
  - Development of clinical practice guidelines
  - Trialing and evaluating promising wound healing therapies
  - Donor site management research project
  - Close relationship with researchers
  - Wound education research grant proposal

Advancing The Science

- Recent injuries
  - MOI: Dismounted IED
  - High bilateral lower extremity amputations +/- vascular injuries
  - Associated open pelvic ring injuries
  - Associated pelvic floor/perineal ST injuries
  - Associated UG injuries
  - High risk of intra-pelvic DVT / PE

CDR Elster, MC, USN
Director For Surgical Services Role 3 MMU
Kandahar, Afghanistan

Advancing The Science

- Negative Pressure Wound Therapy (NPWT)
  - Increasing blood flow through reduction of interstitial edema
  - Removal of inflammatory cytokines and management of exudate
  - Mechanical deformation of cells
  - Other benefits
    - Reduces need for frequent changes
    - Contains effluent
      - Research
      - Infection

Crumbley, D., Perciballi, J.. Negative Pressure Wound Therapy in a Contaminated Wound. J Wound Ostomy Continence Nurs. 2007;34(5):507-512.

Advancing The Science

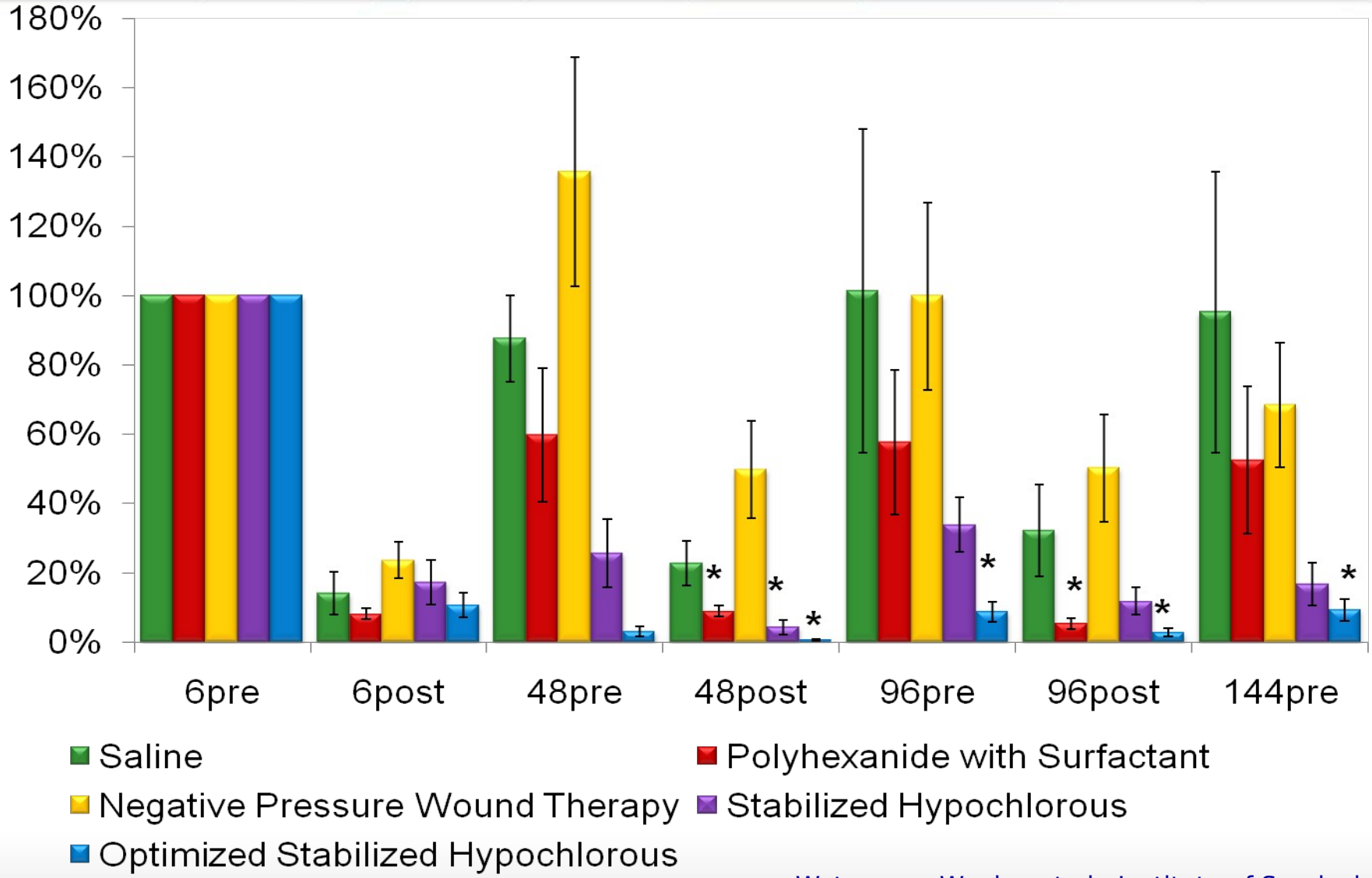
- Negative Pressure Wound Therapy (NPWT)
  - 2008 in-flight feasibility study LRMC to CONUS
  - 2009 Challenge; NPWT units available for in-flight care
    - Air Force purchased units placing into PMI
  - 2010 significant increase in MEDEVAC Wounded receiving NPWT

Advancing The Science

- Developing solutions to complex problems
  - Increasing incidence of high AKA amputations with accompanying fungal infections
  - Need for local therapy
    - Wound VAC™ Instill® therapy
    - Dakin's irrigation solution
- Optimized Stabilized Hypochlorous Solution
  - Decrease bacteria at all time points after initiation of treatment (p = 0.0002)

Waterman, Wenke, et al. Institute of Surgical Research, unpublished data.

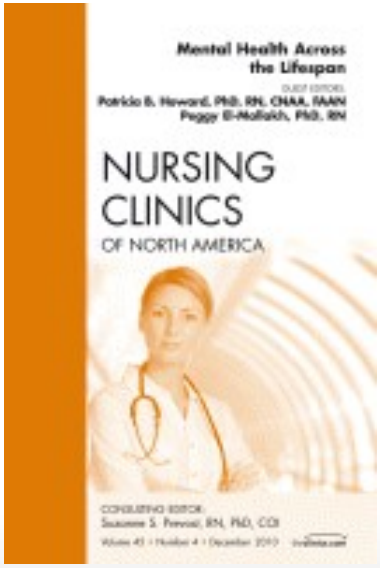
Bacteria Quantity In Open Fracture Model



Waterman, Wenke, et al. Institute of Surgical Research, unpublished data.

Education / Knowledge Transfer

- Pressure ulcer prevention program
  - Incidence of pressure ulcer formation among Wounded
  - FMEA, chart review, EBP project



Development if an Evidence-Based Pressure Ulcer Prevention Program at the National Naval Medical Center: Crumbley, D, and Kane, M., "Nurses' Role in Risk Factor Assessment, Prevention, and Intervention Among Young Service Members from OIF/OEF", Nursing Clinics of North America Volume 45, 2, Jun 2010.

Education / Knowledge Transfer

Pressure Ulcer Prevention & Management Cliff Notes

OP AIM: TAKING AIM AT PRESSURE ULCER PREVENTION

Optimize Nutrition and Hydration
- Consider Nutrition Consult

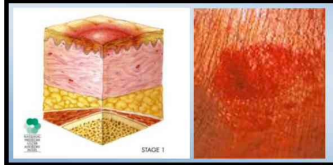
Pressure Reduction
- Turn every 2 hrs – Place Turn Clock in Room
- Elevate heels off bed
- Do not place patient on affected side
- Reduce friction/shear

Assessment
- Monitor and reassess Braden Score on admission and q shift

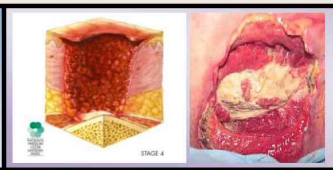
Inspect Skin Daily

Moisture Management
- Keep patient clean and dry
- Moisture barrier on incontinent patients
- No diapers/plastic-lined chux pads

PRESSURE ULCER CLASSIFICATION AND MANAGEMENT



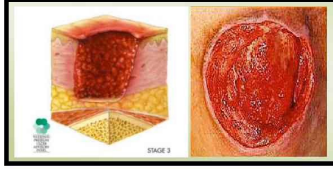
STAGE I
* Good Skin Care
* Off-Load Pressure/Reposition
* OP AIM
* No dressing required



STAGE IV
* Consult Wound Care Nurse
* Off-Load Pressure/Reposition
* OP AIM
* Consider Specialty Mattress

STAGE II
* Off-Load Pressure/Reposition
* OP AIM
* Hydrocolloid/Foam Dressing for Protection from Shear/Friction

UNSTAGEABLE
* Consult Wound Care Nurse
* Off-Load Pressure/Reposition
* OP AIM
* Consider Specialty Mattress



STAGE III
* Consult Wound Care Nurse
* Off-Load Pressure/Reposition
* OP AIM
* Consider Specialty Mattress

SUSPECTED DEEP TISSUE INJURY
* Wound Care Nurse
* OP AIM
* Consider Mattress
* Reposition

HIGH RISK PATIENTS: * Braden Scale ≤12 * Elderly & Frail * Immobile *Spinal Cord Injury * TBI * Ventilator Dependent * Sensory Deficit (Epidural/Nerve Block) * Sensory Neuropathy (Diabetic)

Education / Knowledge Transfer

National Naval Medical Center Therapeutic Support Surface Algorithm

OP AIM: Key Factors to Prevention and Treatment of Pressure Ulcers for All Patients

1. Optimize Nutrition and Hydration
2. PRESSURE REDUCTION
   a. Patients should be turned/repositioned **EVERY 2 HOURS** unless clinically contraindicated, even when using specialty mattresses. **NONE** of the below mattresses are designed to turn patients for pressure relief.
   b. Heels should be floated off the bed when indicated even when using specialty mattresses
   c. Minimize injury related to shearing and friction forces – Lift, don't drag, patient up in bed
3. Assessment - Admission and Daily Braden Risk Assessments.
4. Inspect Skin Daily
5. Moisture Management
   a. Keep skin dry and clean of bodily fluids
   b. Moisturize dry skin and protect moist/wet skin
   Remember that use of a therapeutic surface is only ONE PIECE of Pressure Ulcer Treatment and Prevention

High Risk Patients:

- Braden Scale ≤12
- Elderly & Frail
- Immobile
- Spinal Cord Injury or TBI
- Ventilator Dependent
- Sensory Deficit (Epidural/Nerve Block)
- Sensory Neuropathy (Diabetic)

Atmos Air™ 9000
(Hospital owned mattress on the majority of NNMC beds)

- No Breakdown or Stage I or II Pressure Ulcer
- Braden Score ≥13
- Weight limit 500 lbs

Versacare® P500
(Hospital Owned)

- Early prevention/ treatment of Stage I, II and uncomplicated Stage III/IV in patients with multiple turning surfaces
- Braden Score ≤12
- Mild Incontinence Associated Dermatitis (IAD)
- Weight limit: 500 lbs

First Step® Select Overlay
(KCI rental)

- Moderate to Severe IAD
- Stage I or II PU at high risk for additional breakdown
- Stage III or IV ulcer not at high risk for additional breakdown
- Braden Score ≤ 12
- Can use with Spirit Select Low Bed
- Weight Limit: 250 lbs

KinAir™ IV
(KCI Rental)

- Moderate to severe Incontinence Associated Dermatitis
- Stage III, IV or unstageable pressure ulcer
- Braden score ≤ 12
- Two or more pressure ulcers on 2 or more turning surfaces
- Weight limit: 300 lbs

Fluid®Air Elite
(KCI Rental)

- Status post skin flap
- Dermatological Skin Conditions, i.e., Stevens-Johnson Syndrome, necrotizing fasciitis, and burns
- High risk with extensive breakdown (pressure ulcers on multiple turning surfaces)
- Weight limit: 250 lbs

TotalCare SpO2RT®
(Hospital Owned)

- ICU bed used at NNMC
- Adequate for Stage I – IV pressure ulcers, for Braden Score ≤ 12 and Incontinence Associated Dermatitis
- Weight limit: 500 lbs

TriaDyne Proventa™
(KCI Rental)
****ICU ONLY****

- Treatment and prevention of pulmonary complications associated with immobility
- Adequate for Stage I – IV pressure ulcers, for Braden Score ≤ 12 and Incontinence Associated Dermatitis
- Weight limit: 350 lbs

RotoRest™
(KCI Rental)
****ICU ONLY****

- Spinal injury patients who have or are at risk for pulmonary complications related to immobility
- Close monitoring for development of pressure ulcers required
- Weight limit: 330 lbs

RotoProne™
(KCI Rental)
****ICU ONLY****

- Severe pulmonary complications such as VAP and ARDS with restricted mobility
- Close monitoring for development of pressure ulcers required
- Weight range: 88-350 lbs

Spirit Select Low Bed
(KCI Rental)

- HIGH FALLS risk Patient
- Can use in combination with First Step Select Overlay
- Weight limit: 250 lbs w/ First Step Select Overlay 500 lbs with Atmos Air 9000

HELPFUL HINTS

1. The algorithm is only intended to be a guide for appropriate bed selection. The final selection should not be based solely on Braden Score and staging of a current pressure ulcer. Clinical judgment should be used to assess entire patient picture, such as location of ulcer and when/why the pressure ulcer occurred.
   a. Example 1: A patient who developed a Stage IV pressure ulcer when they were sedated and unable to move, who is now ambulatory generally does not need a specialty surface.
   b. Example 2: Pressure ulcers located on the heels can be treated by floating the heels off the bed. Unless the patient is at a high risk for further skin breakdown, a specialty mattress may not be indicated.
2. Only use Dry Flow pads under patients on low air loss mattresses.
3. The turn-assist function found on several of the beds is not to be used as a replacement for manually repositioning a patient q2h.

To Order a KCI Therapeutic Support Surface:

1. Determine which therapeutic surface is appropriate.
2. Obtain physician order for specialty bed you are ordering.
3. Call KCI Customer Support at 1-800-275-4524, 24 hours/day, 7 days/week
   a. National Naval Medical Center's Account ID: 202120
   b. National Naval Medical Center's PO#: N00168-05-F-0800
   c. Patient's name
   d. Name of product being ordered
   e. Location of delivery (unit name, patient room #)
4. When therapeutic surface arrives from KCI, Biomed must be notified
   e. 295-5515
   f. After hours: 301-442-2076
   g. Pager system: 1-800-759-8888
   h. Pager: 1418101

****Please consult wound care team if you are unsure of which bed to order or if none of the above beds meet the needs of your patient****

Education / Knowledge Transfer

Competencies for Deploying Nurses	
Complex wound management •Large soft tissue injuries •Amputations •Disarticulations •Fasciotomies •Open abdomen	Evaluating traumatic large, complex soft tissue injuries related to blasts and projectiles
Obtaining ABIs and assessing for compartment syndrome	Management of infected wounds and abscesses, and wound pain
Preventive skin care	Burn wound care
NPWT application and management	Wound assessment and documentation
Ostomy and fistula care	Wound cleansing

Smith, K, Crit Care Med 2008 Vol. 36, No. 7 (Suppl.)

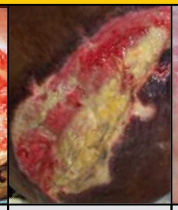
Education / Knowledge Transfer

- DoD / VA Wound Care Course
  - Established in 2008
    - Extensive 5-day course with skills training
    - Open to DoD and VA
      - Physicians, Nurses, Physical Therapists, Corpsmen/Medics
    - Future WOCN approved course with credentials
- Emory University Wound Care Specialty Course Preceptor Program
  - MOU with Emory at NNMC and WRAMC
  - Military and civilian students

Education / Knowledge Transfer

NNMC & WRAMC Wound Dressing Selection Guide

WALTER REED ARMY MEDICAL CENTER

Wound Appearance								
Description	Eschar* (Colors may vary)	Predominantly Slough (Infection may be present)	Granulating/ Mixed Wound Tissue	Fibrin (Appears yellow)	Granulating and/or Epithelializing	Skin Tear	Epithelializing	Healed Wounds, Skin at Risk or Closed Surgical Incisions
Exudate Level (= indication of exudate level)	Moderate to None	High ← → to Moderate			Moderate ← → to Scant			None
Depth	Unknown	Deep	Deep/Shallow	Deep/Shallow	Deep/Shallow	Shallow	Shallow	Closed
Treatment Objective	Debride*	Cleanse, Debride, Absorb, Fill Dead Space			Protect, Hydrate, Fill Dead Space			Protect
Suggested Products and Change Rates (To the right are management options for each wound condition)	Carrasyn V Gel or Collagenase (needs Rx) (Daily) Cover choices: **Alldress®** or **Mepilex® Border** or **Mepilex® Border Lite**	Iodosorb Gel (Every 2 days) or **Melgisorb®** (Up to 4 days) or Aquacel Cover choices: **Alldress®** or **Mepilex®** or **Mepilex® Border**	Deep Iodosorb Gel (Every 2 days) or **Melgisorb®** (Up to 4 days) or Aquacel Cover choices: **Alldress® or Mepilex® or Mepilex® Border** Shallow **Alldress®** or **Mepilex®** or **Mepilex® Border** or Comfeel Plus	Moderate Exudate Iodosorb Gel (Every 2 days) or **Melgisorb®** (Up to 4 days) or Aquacel Cover choices: **Alldress®** or **Mepilex® Border** Minimal Exudate **Mepilex®** or **Mepilex® Border Lite** Shallow **Alldress®** or **Mepilex® Border Lite** or Comfeel Plus	Moderate Exudate **Melgisorb®** (Up to 4 days) or Aquacel Cover choices: **Alldress®** or **Mepilex® Border** Minimal Exudate **Alldress®** or **Mepilex® Border** or **Mepilex® Border Lite** or Comfeel Plus Contact layer **Mepitel®‡** (Up to 10 days)	Skin Tear Prevention Tubifast® to upper and lower extremities as needed Contact layer **Mepitel®‡** (Up to 10 days) or **Mepilex® Border** or **Mepilex® Border Lite** or **Mepilex®** or **Mepilex® Lite**	**Mepitel®‡** (Up to 10 days) or **Mepilex®** or **Mepilex® Lite** or **Mepilex® Border** or **Mepilex® Border Lite** or **Alldress®** or Comfeel Plus	**Mepilex® Border Lite** or **Mepilex® Lite** or Apply 3M No-Sting Barrier (Daily) Post Surgical **Mepilex® Border Post-Op** Radiation Dermatitis **Mepilex® Lite** or **Mepilex® Transfer**
	Consider using Mepilex® Ag or Aquacel Ag or Melgisorb® Ag when antimicrobial effect is desired							
Notations	✪ Use secondary dressing over **Mepitel** ✪ Use **Mepitac** Tape on fragile skin. Secure dressings with **Tubifast** of roll gauze. ✪ For complex wounds consult the Wound Care Team ✪ Date and time ALL dressings				✪ Utilize **Mepilex Heel** or **Mepilex Border** as needed for heel wounds and/or protection from shearing ✪ Wear time for each dressing is up to 7 days unless otherwise noted ✪ Cleanse wounds with normal saline or wound cleanser with each dressing change ✪ Dressings with **Safetac®** technology do NOT require use of skin barrier products.			

Individuals with wound infection or those at high risk for infection may require more frequent changes as well as adjunctive antibiotic therapy. Before any healing process can begin, two critical steps must be taken as part of a well-defined management protocol: 1) The wound assessment and 2) Management of causative and contributing factors including unrelieved pressure, shear and friction, excessive moisture and altered nutritional status.

* Debridement of eschar may be contraindicated in some situations such as dry, fused, stable eschar. Debridement is indicated if signs/symptoms of infection are present.

‡ Creams or ointments may be applied over **Mepitel** as indicated. **Mepitel** may be left in place during wound cleansing and irrigation. Change secondary dressings as needed.

This tool has been provided by means of an educational grant to NNMC & WRAMC by Mölnlycke Health Care.

The suggested topical management options and change rates are the treatment choice of NNMC & WRAMC and may not reflect the opinions of Mölnlycke Health Care

MÖLNLYCKE® HEALTH CARE

Education / Knowledge Transfer

- NNMC and WRAMC wound education programs and policy development
  - NPWT
    - Standard
    - Instill™ VAC® therapy
  - Institutional wound care education
    - Departmental training
    - Orientation
    - Policy education

Business Operations

- Specialty bed and support surface management
  - $1 million dollar + per year
    - NNMC $450,000 in 2007
    - WRAMC $950,000 in 2009
  - Collaborative effort to establish WRNMMC contract and algorithm
    - Enhance care
    - Efficient operations

Business Operations

- Wound VAC® / Negative Pressure Wound Therapy (NPWT)
  - Over $2 million per year between NNMC / WRAMC
  - Recent purchase of 20 units at NNMC
    - $450,000
    - One year return on investment
  - In-house tracking program to reduce waste

Business Operations

- Wound care supplies
  - Standardize throughout the NCA
  - Establish product availability
  - Future: mail order supplies
- Ostomy supply distribution
  - Transfer to a mail-order process
    - Reduce MTF expenditures for outpatient supplies
    - Reduce storage space required
    - Provide broader range products
    - Convenient delivery

DoD Level Activities

- Make advanced wound care supplies available to the operational end user
- Develop a standardized advanced wound care pictorial formulary and educational guide
  - Evidence-based wound care practices
  - Provide the user with all necessary ordering information
    - NSN's and Prime Vendor Numbers
    - Provide all six possible product identifiers

DoD Level Activities

- Established a Joint wound care advisory team
  - Army, Navy, Air-Force, Marines, Canadian AF, civilian and military wound care experts, and DoD logisticians (DMMPO)
- Defined current advanced wound care needs for the operational environment
  - Acute and chronic

DoD Level Activities

CONTACT LAYERS

Indications for Use:

- Primary dressing intended for direct use on wound
- Superficial wounds and skin tears
- Partial and full thickness skin grafts
- Skin abrasions and lacerations
- Second degree burns
- Silver form (Acticoat Flex) used underneath wound VAC foam for antimicrobial effect

Advantages:

- Silver form available
- Minimizes pain and trauma during dressing changes
  - Will not adhere to moist wound beds
  - Prevents secondary dressing from adhering to wound
- Conforms well
- Dressings are generally porous and allow fluid to be pulled through to the secondary dressing
- Can remain in place when changing secondary dressing – does not need to be removed with each dressing change

Disadvantages:

- Must use with a secondary dressing to absorb drainage
- Can't be used on wounds with tunneling, stage I pressure ulcers, or third-degree burns

Products Available

Mepitel® One 4"x7"; 6.8"x10"

- Transparent for easy wound inspection
- Silicone based
- May stay in place for up to 14 days
- Tacky side is placed on wound
- Quantity: 70 pieces per case (4"x7"); 40 pieces per case (6.8"x10")
- Manufacturer: Molnlycke Healthcare
- NSN: 6510015883378 (4"x7"); NSN: 6510015883349 (6.8"x10")
- Nomenclature: Dressing, Specialty, Wound, 4" x 7"; Dressing, Silicone, Non-Adherent, 6.8" X 10"
- Part Number: 289500 (4" x 7"); 289700 (6.8" x 10")
- O&M Prime Vendor Part Number: 0158289500 (4" x 7"); 0158289700 (6.8" x 10")
- Cardinal Health Prime Vendor Number: MHC289500 (4" x 7"); 289700 (6.8" x 10")

Xeroform™ Sterile White 9"x5"

- Petroleum mesh gauze
- Quantity: 50 pieces per box; 100 pieces per case
- Manufacturer: Covidien
- NSN: 6510013060898
- Nomenclature: Dressing, Petroleum, Mesh Gauze, 9" x 5"
- Part Number: 433605
- O&M Prime Vendor Part Number: 35838443605
- Cardinal Health Prime Vendor Number: 433605

DoD Level Activities

CONTACT LAYERS

Instructions for Use

Mepitel® One, Xeroform™, Adaptic™

- Contact layer should be placed directly on wound or skin graft
- Contact layer should be cut to overlap wound edges by at least 2cm. Allow for more overlap with large wounds
- If used to secure skin grafts, dressing should not be changed for the first 5 days following application.
- Contact layer should always be used between a new skin graft recipient site and wound vac foam to prevent loss of graft when vac foam is removed (see example below)
- Mepitel® One can remain in place for maximum of 14 days
- Contact layers should be changed if pores become clogged with drainage
- Use a secondary dressing to secure contact layer.

Commonly used on:

- Skin tears, abrasions, surgical incisions, second degree burns, blistering, lacerations, diabetic ulcers, venous and arterial ulcers, partial and full thickness grafts

- Example of contact layer used over a new split thickness skin graft and under a wound vac

Acticoat◊ Flex 3

- Moisten dressing with water if wound is dry or has minimal exudate. Do not need to moisten if there is a high level of exudate. Do not moisten with normal saline as this will prevent silver ion release.
- Cut dressing to wound size and apply to wound bed without stretching.
- When covering a joint, apply Flex with the direction of the stretch running along the limb to allow movement
- Dressing may remain in place for up to 3 days

Over V.A.C. foam Directly on wound bed

References:

- Acticoat◊ Flex 3. Retrieved August 9, 2010. From http://global.smith-nephew.com/us/NEW_ACTICOAT_FLEX_29086.htm.
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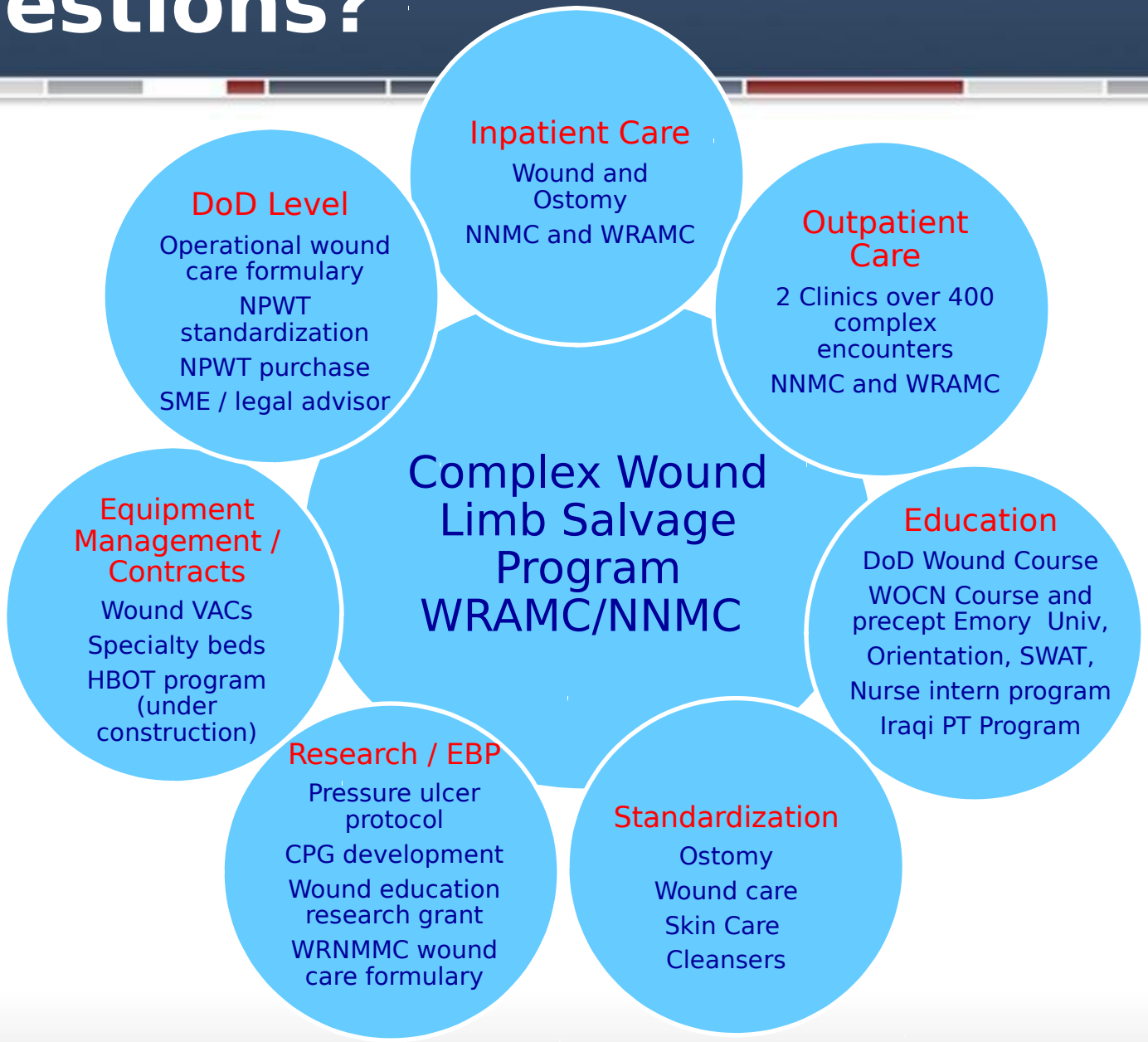
- Xeroform™. Retrieved August 10, 2010. From http://www.kendallhq.com/kendallhealthcare/pageBuilder.aspx?contentID=94988&webPageID=0&topicID=79616&breadcrumbs=0:121623,154339:0,155107:0#Instructions%20for%20Use

DoD Level Activities

- SME for advanced wound care
  - NPWT standardization
  - AMAL configuration
    - AMAL for Advanced Wound Care

Questions?


Complex Wound Limb Salvage Program WRAMC/NNMC
Inpatient Care
Wound and Ostomy
NNMC and WRAMC
Outpatient Care
2 Clinics over 400 complex encounters
NNMC and WRAMC
Education
DoD Wound Course
WOCN Course and precept Emory Univ,
Orientation, SWAT,
Nurse intern program
Iraqi PT Program
Standardization
Ostomy
Wound care
Skin Care
Cleansers
Research / EBP
Pressure ulcer protocol
CPG development
Wound education research grant
WRNMMC wound care formulary
Equipment Management / Contracts
Wound VACs
Specialty beds
HBOT program (under construction)
DoD Level
Operational wound care formulary
NPWT standardization
NPWT purchase
SME / legal advisor